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In re HENZE

(CCPA)
85 USPQ 261
Decided Apr. 3, 1950
Appl. No. 5659
U.S. Court of Customs and Patent Appeals

Headnotes

PATENTS

1. Patentability -- Invention -- Specific cases

Whether invention exists over prior art isomers and homologues is question to be decided in each case; patentability is not resolved conclusively even where unexpected or unobvious beneficial properties are established to exist in novel members of homologous series over prior art members, as circumstances of case may require consideration of other factors; mere difference in degree is not the marked superiority which ordinarily will remove unpatentability of adjacent homologues of old substances; reason for rule is that characteristics normally possessed by members of homologous series are principally the same, and vary but gradually from member to member; chemists knowing properties of one member of series would in general know what to expect in adjacent members.

2. Patentability -- Invention -- Specific cases

Pleading and practice in Patent Office

Presumption of unpatentability arises against claim directed to composition of matter, the adjacent homologue of which is old in art; burden is on applicant to rebut presumption by showing that claimed compound possesses unobvious or unexpected beneficial properties not actually possessed by prior art homologue; it is immaterial that prior art homologue may not be recognized or known to be useful for same purpose or to possess same properties as claimed compound; this does not mean that in every case Patent Office is justified in exacting empirical data from applicant as to properties of prior art homologue tested under same conditions and limitations as are set forth for claimed compound where reaction of old compound under those conditions is well established fact of general cognizance in art, but such data is required where nothing is known of properties of prior compound under conditions and limitations set forth for claimed compound; Office has right to require such evidence of invention as is suitable to dissolve presumption of unpatentability arising out of nature of subject matter where criteria raising presumption are of universal acceptance by those skilled in art.

3. Patentability--In general

Elements of consideration underlying patent monopoly are not artificial or insubstantial; each must be conclusively satisfied if Patent Office is not to act ultra vires in grant of patent;R.S. 4886 permits Office to grant patent only where invention, novelty, and utility coexist; advance over art is fourth element implicit in that recital.

4. Patentability -- Invention -- Specific cases

To those skilled in chemical art, one homologue is not such an advance over adjacent member of series as requires invention, unless beneficial properties realized in new homologue lie clearly

outside of expectations which knowledge of his science would inform chemist should be inherent in product.

5. Patentability--New use or function--In general

New use for old product is not patentable.

6. Patentability -- Invention -- Specific cases

Claims to compound in homologous series are rejected where reference suggests class of compounds; it does not matter that reference does not name all members of class since generic designation used is according to standard chemical nomenclature and conveys to chemists the relationship to be observed in uniting classical organic radicals in compounds susceptible to conventional synthesis; even if that were not so, mere disclosure of single species would have been sufficient to bar the way.

7. Patentability--New use or function--In general

More than new advantage of product must be discovered to lend it patentability.

Particular patents--Hydantoins

Henze, Hydantoins and Methods of Obtaining the Same, claims 1 to 3 of application refused.

Case History and Disposition:

Appeal from Board of Appeals of the Patent Office.

Application for patent of HenryR. Henze, Serial No. 535,743; Patent Office Division 6. From decision rejecting claims 1 to 3, applicant appeals. Affirmed.

Attorneys:

WHITTEMORE, HULBERT & BELKNAP, Detroit, Mich. (L. GAYLORD HULBERT, Detroit, Mich., and GEORGE A. DEGNAN, Washington, D. C., of counsel) for appellant.

E. L. REYNOLDS (J. SCHIMMEL of counsel) for Commissioner of Patents.

Opinion Text

Opinion By:

JOHNSON, Judge.

On May 15, 1944, the appellant filed an application in the United States Patent Office for a patent covering improvements in "Hydantoins and Methods of Obtaining the Same." The subject matter of the patent application is said to be a new class of chemical compounds valuable in therapeutic use by reason of high anticonvulsant activity combined with low toxicity.

On July 16, 1946, the Primary Examiner in the Patent Office entered a final rejection of all of the claims (1, 2, and 3) in the application as lacking invention over the disclosure appearing in a 1936 scientific publication. When the appellant appealed to the Patent Office Board of Appeals the decision of the examiner was, on December 12, 1947, affirmed. The appellant thereupon filed a Petition and Supplemental Petition for Reconsideration, both of which were denied by the board on February 18, 1948.

The applicant has appealed to this court from those decisions of the board.R.S. 4911, 35 U.S.C. 59a.

Claim 3 is illustrative of the subject matter. Broader claims 1 and 2 are set out in the margin. [1] No claims were presented covering the method of preparing the compositions of matter claimed.

3. 5-Isopropoxymethyl - 5 - phenylhydantoin.

The publication upon which the finding of lack of invention was based by the examiner and board is Volume 58, Journal of American Chemical Society, pages 474-477.

Hydantoin is considered a derivative of amino-acetic acid. It is found in molasses. C - homologues, phenyl - ethyl - hydantoin, known as nirvanol, are used as hypnotics. Organic Chemistry, Karrer, 3d Ed., 1947, p. 286-7. It is also identified as glycolyl urea with a formula NH CO NH CO CH $_2$Chemical and Technical Dictionary, Bennett, 1947.

Henze's application is directed to compounds derived from hydantoin and having the general structural formula
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where R represents an alkyl radical [2] of from 3 to 12 carbon atoms. M represents hydrogen or a non-toxic salt forming element or group, such as sodium, magnesium, ammonium, and substituted ammonium (e.g., mono and dialkyl ammonium and corresponding hydroxy alkyl ammonium). The specification not only details methods of preparation of the claimed compounds, but also recites specific dosages applicable generally to adults.

Claim 1 is the generic claim. Claim 2 is somewhat narrower, being drawn to compounds in which R represents a branched chain alkyl. Claim 3 is specific to a compound in which R is isopropyl and M is hydrogen. The compound of claim 3 corresponds to the formula
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In the March 1936 edition of the Journal of American Chemical Society (Volume 58 at pages 474 to 477) there was published an article written "by Neil E. Rigler with HenryR. Henze," the latter being the appellant, entitled "Synthesis of Compounds with Hypnotic Properties. I. Alkoxymethylhydantoins." The authors state that soporifics of definite potency and usefulness had been produced, prior to their investigation, as a result of extensive studies

performed among the series of alkyl disubstituted barbituric acids. Because of the structural relationship of hydantoin to barbituric acid, the authors selected for their investigation the inquiry of whether the innocuous substance hydantoin might, by the attachment of alkyl, alkyloxy, aryl, or aryloxyalkyl groups to the nucleus, be converted into soporific derivatives. It was stated by the authors that in their research, "the groups attached to the hydantoin nucleus, either directly or through the methoxy grouping, were those which have been demonstrated to possess a definite narcotic effect." They included in their synthesis a variation wherein one of the alkyls was attached indirectly through the methoxyl group "so that the compounds prepared are 5,5' -- alkoxymethyl alkyl (or aryl) hydantoins." A method of preparation was used which yielded an end product conforming to the general formula

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In Table VII of the experimental data set forth in the article there appears under the heading "Alkoxymethyl Hydantoins" (adjacent to which appears the general formula

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which is the equivalent of the general formula next above) columnar tabulations identifying the specific radicals which were substituted for the R and R' in the synthesis and experimentation. The sixth entry in Table VII identifies R as "Ethyl" and R' as "Phenyl." The ethyl radical is C_2H_5 (or CH_3CH_2) and the phenyl radical is the aryl or aromatic monovalent hydrocarbon radical C_6H_5. There is thus disclosed, when the substitution is made in the end product formula, supra, the compound ethoxymeth

ylphenylhydantoin, conforming to the general formula,

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which may be stated as 5-ethoxymethyl-5-phenylhydantoin.

It is at once apparent that the compound of the disclosure differs from the compound of claim 3 merely by CH_2. The claimed compound is thus the next higher homologue of the compound disclosed in the publication.

Of the pharmacological utility of ethoxymethylphenylhydantoin, the authors stated that it "in moderate doses causes convulsions and for it the range between the effective and lethal doses is too narrow."

Parke, Davis & Company are the assignees of the appellant's patent application. An affidavit of record by the Director of Chemical Research of that company states that numerous samples of various hydantoins, including "Dilantin" (sodium diphenyl hydantoinate) and 5-isopropoxymethyl - 5 - phenylhydantoin, were supplied by him to Drs. Merritt and Putnam. They then submitted to the Director reports of actual clinical tests which indicated that out of many hundreds of compounds studied by them for anti-convulsant activity and effectiveness, the two mentioned possessed outstanding activity and effectiveness in the clinic, were non-toxic, and, on the basis of results secured in their use in the electrically induced convulsion test for cats, both were safe drugs to use. That and other test data were stated by the affiant definitely to show "that 5-Isopropoxymethyl-5-phenyl hydantoin is a safe anticonvulsant of high activity and outstanding effectiveness."

The examiner had held, following In re Hass et al., 31 C.C.P.A. (Patents) 908, 141 F.2d 130, 60 USPQ 552 , that the claims in issue were unpatentable, lacking invention over the disclosure of the publication, because the appellant had failed to show that the compounds claimed had an unexpected beneficial property not possessed by

the lower adjacent homologue disclosed in the publication. The examiner held that the affidavit did not aid in conferring patentability upon the rejected claims because there was no showing that the lower homologue would not yield results similar to the claimed compounds under certain dosages.

The board upheld the examiner's position and emphasized that it was necessary that there be proof by the appellant that the compound of the reference does not have the same effect as the claimed compounds under the same conditions of dosage. The disclosure in the publication of the class of compounds, 5,5'-alkoxymethyl alkyl (or aryl) hydantoins, was also held by the board to be a disclosure of the class of compounds of claims 1 and 2.

Appellant admits that 5-ethoxymethyl-5-phenylhydantoin, disclosed in the reference, is a lower homologue of the compound set out in claim 3. He acknowledges that the publication cited against his claims is silent as to the effects produced by 5-ethoxymethyl-5-phenylhydantoin at less than moderate dosages, but he contends that even if convulsions would not occur, there was no inference that the compound would have anti-convulsion utility at such lower dosages. Appellant's position is that it is sufficient if he shows that his compounds have utility and unexpected beneficial properties *not known to be possessed* by the prior art homologue. He insists that it was error for the Patent Office tribunals to require him to establish that his claimed compounds possessed unexpected properties *in fact not possessed* by the prior art homologue.

[1]A homologous series is a family of chemically related compounds, the composition of which varies from member to member by CH_2(one atom of carbon and two atoms of hydrogen). In re Loring Coes, Jr., 36 C.C.P.A. (Patents) 1067, 173 F.2d 1012, 81 USPQ 369 . The court's rule on the patentability of a composition of matter over an adjacent homologue old in the art has been uniformly applied. In the case of In re Lincoln et al., 29 C.C.P.A. (Patents) 942, 126 F.2d 477, 53 USPQ 40 , claim 14 there in issue was held properly rejected as lacking invention over references disclosing homologues of the compound described in claim 14 "there being no showing in the record that appellant's compound has any unexpected beneficial results." In the Hass cases, 31 C.C.P.A. (Patents) 895, 903, 908; 141 F.2d 122, 127, 130; 60 USPQ 544, 548, , it was clearly laid down that "to be patentable, novel members of a homologous series of chemical compounds must possess some unobvious or unexpected beneficial properties not possessed by a homologous compound disclosed in the prior art." Whether invention exists over prior art isomers and homologues is a question to be decided in each case. In re Hass et al., 31 C.C.P.A. (Patents) 903, 141 F.2d 127, 60 USPQ 548 . Patentability is not resolved conclusively even where unexpected or unobvious beneficial properties are established to exist in

novel members of a homologous series over prior art members, as the circumstances of the case may require a consideration of other factors. In re Finley, 36 C.C.P.A. (Patents) 998, 174 F.2d 130, 81 USPQ 383 . A mere difference in degree is not the marked superiority which ordinarily will remove the unpatentability of adjacent homologues of old substances. In re Loring Coes, Jr., supra. The reason for the rule is that the characteristics normally possessed by members of a homologous series are principally the same, and vary but gradually from member to member. Chemists knowing the properties of one member of a series would in general know what to expect in adjacent members. In re Norris, 37 C.C.P.A. (Patents) 876, 179 F.2d 970, 84 USPQ 458 . The same rule applies to isomers. In re Jones, 34 C.C.P.A. (Patents) 1168, 162 F.2d 638, 74 USPQ 152 ; In re Norris, supra.

[2] In effect, the nature of homologues and the close relationship the physical and chemical properties of one member of a series bears to adjacent members is such that a presumption of unpatentability arises against a claim directed to a composition of matter, the adjacent homologue of which is old in the art. The burden is on the applicant to rebut that presumption by a showing that the claimed compound *possesses* unobvious or unexpected beneficial properties not actually *possessed* by the prior art homologue. It is immaterial that the prior art homologue may not be recognized or *known* to be useful for the same purpose or to possess the same properties as the claimed compound. This does not mean that in every case the Patent Office would be justified in exacting

empirical data from an applicant respecting the properties of the prior art homologue tested under the same conditions and limitations as are set forth for the claimed compound where the reaction of the old compound under those conditions is a well established fact of general cognizance in the art. Here, however, nothing is known of the properties of the compound of the reference except under "moderate dosage." The appellant admits that nothing is known of the properties of that compound under "less than moderate dosages." It is not known that it will not yield the same or comparable results to the claimed compound under equivalent dosage conditions.

[3][4]The appellant was not refused a patent in limine but was only placed under a reasonable requirement to overcome a presumption reasonably raised and which he could reasonably be expected to meet. Here particularly he would be expected to have access to the fruits of the original research culminating in his joint authorship of the cited publication; moreover, in the absence of such data, the assignee of appellant's patent application, the Parke, Davis Company, might reasonably be expected to have the resources to conduct such tests as would be required. The Patent Office as the public's representative has the right to require such evidence of invention as is suitable to dissolve a presumption of unpatentability arising out of the nature of the subject matter where the criteria raising the presumption, as here, are of universal acceptance by those skilled in the art involved. The elements of the consideration underlying the patent monopoly are not artificial or insubstantial: each must be conclusively satisfied if the Patent Office is not to act ultra vires in the grant of a patent. The statute permits the Patent Office to grant a patent only where invention, novelty, and utility coexist.R.S. 4886, 35 U.S.C. 31. Advance over the art is a fourth element implicit in that recital. Art. I § 8, U.S. Constitution. To those skilled in the chemical art, one homologue is not such an "advance" over an adjacent member of the series as requires invention, unless the beneficial properties realized in the new homologue lie clearly outside of the expectations which knowledge of his science would inform the trained chemist should be inherent in the product. See Ellis on Patent Claims, Sections 474, 475. In the latter event, it may be possible to say that inventive genius and not mere skill of the calling was required to select the new compound, otherwise not.

[5]Adjacent homologues, without more, are but equivalents. Ellis on Patent Claims, Section 365. If by discovering useful properties of a new but adjacent member an applicant may escape the responsibility of showing that the same property is not inherent in an old homologue not theretofore *known* as useful for that purpose, the doctrine that a new use for an old product is not patentable would effectively be wiped out of the law of chemical patents. The principle is too firmly imbedded in our substantive patent law to permit such a result. In re Benner et al., 36 C.C.P.A. (Patents) 1081, 174 F.2d 938, 82 USPQ 49 , and cases cited.

[6] Appellant contends that the board is in error in approving the rejection of claims 1 and 2 on the disclosure in the publication of the class of compounds, 5,5'-alkoxymethyl alkyl (or aryl) hydantoins. As has been noted, the general formula for alkyl radicals is C_nH_{2n+1}; "aryl" refers to the aromatic monovalent hydrocarbon radical, as e.g., phenyl --C_6H_5. Appellant considers that disclo

sure, appearing near the beginning of the article, to be limited to ethoxymethyl-phenylhydantoin because Table VII, near the end of the article lists, as example six, only that combination. We consider the first reference, to 5,5'-*alko* xymethyl alkyl (or *aryl*) hydantoin, as well as the general formula

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in connection with the identification of R' as "Phenyl" in Table VII, and alkyl radicals as R, to suggest a class of compounds. It does not matter that all of the members of the class were not named. The generic designation used was according to standard chemical nomenclature and would convey to chemists the relationship to be observed in uniting classical organic radicals in compounds susceptible to conventional synthesis. In re Von Bramer et al., 29

C.C.P.A. (Patents) 1018, 127 F.2d 149, 53 USPQ 345 . Even if that were not so, the mere disclosure of a single species would have been sufficient to bar the way. In re Williams, 35 C.C.P.A. (Patents) 1219, 168 F.2d 525, 78 USPQ 86 ; In re Steenbock, 23 C.C.P.A. (Patents) 1244, 83 F.2d 912, 30 USPQ 45 .

[7] As to the contention of appellant that the publication is concerned with an examination of the soporific properties of the compounds disclosed, whereas his present application is directed to compounds, which we hold are unpatentable over the reference, with anticonvulsant properties, it is sufficient to state that more than a new advantage of a product must be discovered to lend it patentability; "It is not invention to perceive that the product which others had discovered had qualities they failed to detect." General Electric v. Jewel Co., 326 U.S. 242, 249 [67 USPQ 155, 158].

We agree with the board that appellant should have furnished the proof requested by the examiner showing that the unexpected beneficial properties of high anticonvulsant activity with low toxicity secured by the administration of the claimed compounds in the small dosages specified were not *in fact* possessed by the homologue disclosed in the reference under the same or equivalent dosage conditions. On the record before us, we affirm the decision below that the claims at bar are unpatentable over the references.

Footnotes

Footnote 1. 1. A compound having the formula

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where R is an alkyl radical having from 3 to 12 carbon atoms of the class consisting of straight chain and branched chain radicals and M is a member of the group consisting of hydrogen and non-toxic saltforming groups.

2. A compound having the formula

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where R is a branched chain alkyl radical having from 3 to 12 carbon atoms of the class consisting of a straight chain and branched chain radicals and M is a member of the group consisting of hydrogen and non-toxic salt-forming groups.

Footnote 2. Hydrocarbons rich in hydrogen are known as saturated or paraffin hydrocarbons and correspond to the general formula C_nH_{2n+2}, carbon, C, being tetravalent, and hydrogen, H, being monovalent. Adjacent members of the paraffin series thus differ by CH_2, as Methane (CH_4), Ethane (CH_3CH_3-- or C_2H_6), Propane ($CH_3CH_2CH_3$-- or C_3H_8), etc. The saturated hydrocarbons are known as "alkanes." If a hydrogen atom is thought of as being removed from the paraffin hydrocarbons, groups of atoms remain--called radicals--which may combine with other atoms or groups of atoms to form derivatives, known as monovalent derivatives of the hydrocarbons. Those radicals are referred to as "alkyl radicals" and are characterized by the ending "--yl": thus -- methyl (CH_3); ethyl (C_2H_5); propyl (C_3H_7); butyl (C_4H_9); amyl (C_5H_{11}); hexyl (C_6H_{13}); heptyl (C_7H_{15}); octyl (C_8H_{17}), etc. The general formula of the alkyl radicals is C_nH_{2n+1}(where "n" represents the number of carbon atoms). Karrer, supra pp. 22, 23.

- End of Case -

